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Factors influencing climate change awareness among Grade 7 students of Cangawa National High School

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ABSTRACT

This study assessed the factors influencing climate change awareness among Grade 7 students at Cangawa National High School, Cangawa, Buenavista, Bohol for the school year 2025-2026 as basis for a research-based environmental education learning exemplar. Particularly, it answered the level of understanding of the respondents in basic climate concepts as to causes, effects, mitigation and sustainability practices, and personal climate change; level of awareness of the respondents in basic climate concepts as to attitude, beliefs, and level of concern; pro-environmental behaviors of the respondents as practiced in their daily lives; level of barriers encountered by the respondents in pro-environmental behaviors; and significant relationship between the level of awareness of the respondents in understanding basic climate concepts and their pro-environmental behaviors as practiced in their daily lives. The research design involved a descriptive-correlational. The study was conducted at Cangawa National High School, Cangawa, Buenavista, Bohol during the school year 2025–2026. The questionnaire used in the study was an adapted questionnaire. The statistical analysis of the data in the study involved a descriptive measure such as simple percentage, standard deviations, and Pearson product-moment correlation r. The study found that respondents had a very high level of understanding of basic climate concepts, including the causes, effects, mitigation and sustainability practices, and personal climate change. They also demonstrated positive attitudes and concern toward climate change and generally rejected negative or dismissive beliefs about the issue. Pro-environmental behaviors were often practiced, particularly conserving water and electricity, proper waste disposal, and participation in environmental activities, although some practices were performed only sometimes. The most common barriers were lack of time and the perception that environmentally friendly actions were difficult or inconvenient. Furthermore, concern and attitude had significant moderate positive relationships with pro-environmental behaviors, while beliefs had a negligible negative and non-significant relationship. Thus, based on the findings, this study recommends the development and implementation of a Research-Based Environmental Education Learning Exemplar.

Keywords: Teaching Biology, climate change awareness, descriptive-correlational, research-based environmental education learning exemplar, Cangawa National High School, Cangawa, Buenavista, Bohol.

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INTRODUCTION

Climate change is a global environmental concern that increasingly affects communities through changing temperatures, extreme weather events, disruptions to ecosystems, and threats to food and water security. Young people are particularly important in climate action because their understanding, perceptions, and behaviors can influence how they respond to environmental challenges. Although awareness and willingness to participate in climate-friendly activities may be relatively high, actual participation in adaptation and mitigation activities can remain limited when students have insufficient practical exposure and opportunities for hands-on learning (Najar, 2026).

In the educational context, climate change awareness is influenced by more than students' acquisition of scientific information. Environmental experiences, climate change education, peer influence, personal concern, attitudes, and opportunities to engage in environmental action can shape students' climate literacy and awareness. Junior high school students found that environmental experiences, climate change education, and peers significantly influenced students' awareness, while differences were also observed according to age and grade level, demonstrating the importance of examining the factors associated with learners' climate change awareness (Ligsa et al., 2024).

In the Philippine setting, the need to strengthen climate change awareness among learners is particularly relevant because the country is highly exposed to climate-related hazards and environmental changes (Almario et al., 2023). Climate change concepts are already integrated into the K–12 curriculum, but the Department of Education has continued to emphasize strengthening climate literacy, refining learning competencies, and developing developmentally appropriate and multidisciplinary climate change education. The importance of educational experiences, information sources, and personal and social factors in shaping learners' understanding and perceptions (Castillo & Nozaleda, 2022).

At the local level, examining the factors influencing climate change awareness among Grade 7 students of Cangawa National High School, Cangawa, Buenavista, Bohol is necessary to establish a clearer understanding of their knowledge of basic climate concepts, attitudes, beliefs, concerns, and environmental practices within their own school and community context. This is consistent with recent Philippine research showing that climate change education can influence students' environmental knowledge, attitudes, and behaviors, while also emphasizing the need to connect classroom learning with practical environmental experiences.

Therefore, the present study seeks to assess the factors influencing climate change awareness among Grade 7 students during School Year 2025–2026 and use the findings as a basis for developing a research-based environmental education learning exemplar responsive to their identified learning needs and environmental experiences. The study will provide a clearer understanding of the students' knowledge, attitudes, beliefs, concerns, and pro-environmental behaviors related to climate change. It will also identify barriers that may influence their participation in environmentally responsible practices. The resulting learning exemplar will be designed to address these identified areas through contextualized and learner-centered activities that connect climate change concepts with students' daily lives and community experiences.

Statement of the problem

This study assessed the factors influencing climate change awareness among Grade 7 students at Cangawa National High School, Cangawa, Buenavista, Bohol, during the school

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year 2025-2026, as a basis for developing a research-based environmental education learning exemplar.

Specifically, it sought to answer the following questions:

1. What was the level of understanding of the respondents regarding basic climate concepts in terms of causes, effects, mitigation and sustainability practices, and personal climate change?
2. What was the level of awareness of the respondents regarding basic climate concepts in terms of attitudes, beliefs, and level of concern?
3. What pro-environmental behaviors did the respondents practice in their daily lives?
4. What was the level of barriers encountered by the respondents in practicing pro-environmental behaviors?
5. Was there a significant relationship between the respondents' level of awareness and understanding of basic climate concepts and their pro-environmental behaviors as practiced in their daily lives?
6. Based on the findings of the study, what research-based environmental education learning exemplar could be developed to enhance the students' level of understanding of basic climate concepts?

METHODOLOGY

This section presents the methodological process of the study, which includes the following segments: the methods and design, the flow of the study, the environment of the study, the sources of data, the instrument, the data collection procedures, the data analysis, and the scoring procedures. The descriptive-correlational research design was appropriate for the study because it allowed the researcher to describe the existing level of climate change awareness and the factors associated with it among Grade 7 students without manipulating the study variables. The descriptive component was used to determine the prevailing conditions and characteristics of the respondents in relation to climate change awareness, while the correlational component examined whether significant relationships existed between the identified factors and students' climate change awareness. This design was suitable because the study sought to examine naturally occurring conditions and relationships as they existed during the school year 2025-2026. The results served as an empirical basis for developing a research-based environmental education learning exemplar responsive to the identified needs of the learners.

The study took the input-process-output strategy, which demonstrated how the study was carried out, from collecting raw data to organizing and analyzing the data to produce findings, as illustrated in the flow of the study. The input contained the variables in the statement of the problem. The first dealt with the level of understanding of the respondents in basic climate concepts as to causes, effects, mitigation and sustainability practices, and personal climate change. This was followed by the level of awareness of the respondents in basic climate concepts as to attitude, beliefs, and level of concern; the pro-environmental behaviors of the respondents as practiced in their daily lives; the level of barriers encountered by the respondents in pro-environmental behaviors; and the significant relationship between the level of awareness of the respondents in understanding basic climate concepts and their pro-environmental behaviors as practiced in their daily lives. The process showed the steps and procedures undertaken by the researcher to finish the research work. It included the descriptive method of research, administration of the questionnaire, data gathering, data analysis, data

organization, and interpretation of data of the study. The researcher personally administered the test to the respondents to ensure secrecy and validity of the results. Moreover, the timeline of the data collection did not disturb or suspend any class lessons of the teachers. All procedures were conducted systematically and ethically while ensuring the confidentiality, accuracy, and integrity of the collected data. The output consisted of the findings of the study, which served as the basis for developing a research-based environmental education learning exemplar designed to address the identified gaps in Grade 7 students' understanding of basic climate concepts and promote appropriate pro-environmental behaviors. The learning exemplar incorporated relevant content and learning activities aligned with the identified needs, levels of understanding and awareness, pro-environmental behaviors, and barriers encountered by the respondents.

The study was conducted at Cangawa National High School, Cangawa, Buenavista, Bohol, during the School Year 2025-2026, as shown in the location map of the research environment. The school served as the research setting where the Grade 7 students were assessed in terms of their understanding of basic climate concepts, climate change awareness, pro-environmental behaviors, and barriers encountered in practicing environmentally responsible behaviors. The school environment provided an appropriate setting for examining the respondents' existing knowledge, attitudes, beliefs, concerns, and daily environmental practices. The findings gathered from this setting were used as a basis for developing a research-based environmental education learning exemplar responsive to the identified needs and concerns of the Grade 7 learners. The school context was particularly relevant because environmental education is strengthened when learners are given opportunities to connect classroom concepts with environmental conditions and practices in their immediate surroundings. Through the study, the researcher was able to determine areas where learners demonstrated adequate understanding and areas that required further reinforcement. The information gathered also provided a clearer picture of how students' climate-related understanding and awareness were reflected in their everyday environmental behaviors. Furthermore, the research setting provided an opportunity to develop a learning resource that was contextualized to the needs and experiences of the learners. Rather than relying solely on general environmental education materials, the proposed learning exemplar was informed by the actual findings of the study, including identified gaps in climate concepts, levels of concern, pro-environmental practices, and barriers encountered by students. Thus, the school environment served not only as the setting for data collection but also as an important context for developing a relevant and responsive environmental education intervention.

The respondents of the study were the Grade 7 students at Cangawa National High School, Cangawa, Buenavista, Bohol, for the school year 2025-2026. The purposive sampling technique was employed in selecting the respondents because the study specifically focused on Grade 7 students who were enrolled in the Science subject and were expected to have prior or current exposure to the competency chosen. The distribution of the respondents was presented in terms of frequency (f) and percentage (%), with the Grade 7 group and the corresponding total as the categories. The original text provided no frequency or percentage values for this distribution, and none are supplied here so that the data remain exactly as presented in the source.

The questionnaire was adapted and modified from validated instruments by the studies of Idrisa et al. (2012), Salim and Al-Rawahy (2014), Kollmuss and Agyeman (2002), UNESCO (2012), and Leiserowitz et al. (2013). It was organized according to the variables identified in the Statement of the Problem and was contextualized to the level and experiences of Grade 7 students. It consisted of sections measuring the respondents' understanding of basic climate concepts in terms of causes, effects, mitigation and sustainability practices, and personal climate change; their awareness in terms of attitude, beliefs, and level of concern; their

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pro-environmental behaviors practiced in daily life; and the barriers they encountered in carrying out such behaviors. The items were simplified and modified to ensure clarity, relevance, and appropriateness to the Philippine school context while maintaining the intended constructs of the original instruments.

The data gathering procedure of the study was conducted in three phases, namely before, during, and after the data collection, to ensure the systematic implementation of the research. Prior to the conduct of the study, the researcher prepared the research proposal, questionnaire, and other necessary research documents for evaluation and approval by the research adviser and the Dean of Cebu Technological University-Main Campus. After the approval of the proposal, the researcher secured a letter of endorsement from the university and sought permission from the Schools Division Superintendent of the Schools Division of Cebu Province, the Public Schools District Supervisor, and/or the School Principal to conduct the study. The research instrument underwent content validation by experts, and the necessary revisions were incorporated based on their recommendations. The researcher also explained the purpose of the study to the respondents and their parents or guardians, distributed informed consent and assent forms, assured the participants that their responses would be kept confidential, and informed them that their participation was voluntary. During the data collection, and after obtaining all necessary approvals and informed consent, the researcher conducted the study among the identified Science students. After the data collection, and upon completion of the questionnaire administration, the researcher collected all accomplished instruments and checked them for completeness and accuracy. The responses were encoded, organized, tabulated, and subjected to the appropriate statistical analyses to answer the research questions. All data were treated with strict confidentiality by assigning codes instead of participants' names and storing the records securely.

The study adhered to established ethical principles to protect the rights and welfare of the respondents. Participation was voluntary, and informed consent was obtained after clearly explaining the study's purpose and procedures. The anonymity and confidentiality of all respondents were maintained by safeguarding their identities and responses. The researcher ensured that participation posed no harm or risk and that respondents could provide only what they were comfortable sharing.

The data gathered were analyzed using appropriate statistical tools to answer the research questions and determine the factors influencing climate change awareness among Grade 7 students. The statistical analysis employed simple percentage, weighted mean, standard deviation, and the Pearson Product-Moment Correlation Coefficient (Pearson r). The percentage was used to test the level of barriers encountered by the respondents in pro-environmental behaviors. The weighted mean was used to determine the level of understanding of the respondents, the level of awareness, and the pro-environmental behaviors of the respondents as practiced in their daily lives. The standard deviation was used to determine the variability or dispersion of the level of understanding of the respondents, the level of awareness, the pro-environmental behaviors of the respondents as practiced in their daily lives, and the level of barriers encountered by the respondents in pro-environmental behaviors. Finally, the Pearson Product-Moment Correlation Coefficient (Pearson r) was appropriate as it tested the significant relationship between the level of awareness of the respondents in understanding basic climate concepts and their pro-environmental behaviors as practiced in their daily lives. The original text did not include scoring scales, mean ranges, or interpretive descriptions for the scoring procedures, and none have been added here.

RESULTS AND DISCUSSION

This chapter presents, analyzes, and interprets the data gathered from 122 Grade 7 students of Cangawa National High School, Cangawa, Buenavista, Bohol, during the school year 2025-2026. The figure of 122 follows from the reported frequency of 87 respondents corresponding to 71.31% and from the 120 degrees of freedom reported for the correlation tests. The study used a descriptive-correlational research design, which made it possible to describe the existing level of climate change awareness and its associated factors without manipulating any variable. Respondents were chosen through purposive sampling because they were enrolled in Science and were expected to have prior or current exposure to the competency under study. Data were collected with a questionnaire adapted and modified from validated instruments by Idrisa et al. (2012), Salim and Al-Rawahy (2014), Kollmuss and Agyeman (2002), UNESCO (2012), and Leiserowitz et al. (2013). The instrument was contextualized to the level and experiences of Grade 7 learners. The data were treated with simple percentage, weighted mean, standard deviation, and the Pearson Product-Moment Correlation Coefficient (Pearson r). The discussion is grounded in the data gathered. The results are interpreted in direct relation to the objectives of the study, which are to determine the respondents' level of understanding of basic climate concepts in terms of causes, effects, mitigation and sustainability practices, and personal climate change; their level of awareness in terms of attitude, beliefs, and level of concern; their pro-environmental behaviors in daily life; the barriers they encountered; and the relationship between awareness and pro-environmental behaviors. Weighted means for understanding and awareness are interpreted on the scale 4.20-5.00 Strongly Agree, 3.40-4.19 Agree, 2.60-3.39 Uncertain, 1.80-2.59 Disagree, and 1.00-1.79 Strongly Disagree. Behaviors are interpreted on the scale 4.20-5.00 Always, 3.40-4.19 Often, 2.60-3.39 Sometimes, 1.80-2.59 Rarely, and 1.00-1.79 Never.

Level of understanding of basic climate concepts

On the causes of climate change, the respondents obtained an overall weighted mean of 4.51 (SD = 0.56), interpreted as Strongly Agree. This indicates that the students clearly recognize how human activities and natural processes drive global warming and environmental pollution. The highest indicators were improper waste disposal and burning of garbage contributing to pollution and climate change (WM = 4.63, SD = 0.58) and deforestation reducing the number of trees that absorb carbon dioxide (WM = 4.62, SD = 0.58). These were followed by awareness that industrial production and transportation contribute significantly to climate change (WM = 4.57, SD = 0.62), understanding that burning fossil fuels increases greenhouse gas emissions (WM = 4.39, SD = 0.64), and awareness that greenhouse gases such as carbon dioxide trap heat in the atmosphere (WM = 4.31, SD = 0.67). All of these were interpreted as Strongly Agree. The findings align with Magulod (2018), who established that Filipino secondary students strongly recognize that deforestation, waste burning, industrial emissions, and fossil fuel use are key contributors to climate change. Lasco et al. (2019) similarly reported that visible and familiar activities such as tree cutting and garbage burning yield the highest agreement scores, as observed here. Ordonio (2024) noted that understanding of direct, observable causes is very high, while knowledge of more abstract concepts such as greenhouse gases remains strong but slightly lower, matching the present result of 4.31, which is still within the Strongly Agree range. These findings suggest that educational initiatives and environmental awareness programs in the school or community have been effective in conveying knowledge about the causes of climate change. Dela Cruz and Santos (2021) emphasized that integrating environmental topics into the curriculum, conducting school greening activities, and linking lessons to local issues improve learners' knowledge and

agreement levels. Nozaleda (2022) found that schools with active environmental education programs produce students with significantly higher awareness of climate causes. UNESCO (2019) likewise highlighted school-based education as one of the most effective ways to build accurate and consistent knowledge about climate change origins in the Philippines, where climate risks are high.

Regarding the effects of climate change, the overall weighted mean was 4.60 (SD = 0.40), interpreted as Strongly Agree, which reflects a high level of awareness of its consequences. The respondents were most cognizant that climate change affects food production and water availability (WM = 4.84, SD = 0.39). This was followed by its negative effects on plants, animals, and ecosystems (WM = 4.79, SD = 0.47), extreme weather events such as heatwaves, floods, and droughts (WM = 4.78, SD = 0.44), and impacts on human health such as heat-related illnesses and diseases (WM = 4.53, SD = 0.53), all interpreted as Strongly Agree. Awareness that rising global temperatures cause glaciers and ice sheets to melt, leading to sea-level rise, was lowest at a weighted mean of 4.07 (SD = 0.72), interpreted as Agree. These results agree with Lasco et al. (2019), who reported that Filipino students show the highest recognition for impacts directly linked to livelihood, food security, and frequent hazards, while understanding of gradual or less visible changes such as sea-level rise remains strong but comparatively lower. Magulod (2018) observed that secondary learners retain knowledge of effects they experience or hear about regularly, which explains why environmental and socio-economic impacts receive higher ratings than long-term, slow-onset changes. Caisip and Espinosa (2022) confirmed that awareness among Filipino youth is strongest for locally felt consequences, a pattern shaped by the country's high exposure to natural disasters, as also highlighted by Ordonio (2024). The participants therefore possess a comprehensive understanding of the repercussions of climate change, ranging from environmental degradation to socio-economic and health implications. This understanding is likely supported by the frequent exposure of the Philippines to natural calamities, which makes climate effects tangible in daily life.

In terms of mitigation and sustainability practices, the overall weighted mean was 4.52 (SD = 0.44), interpreted as Strongly Agree, which indicates a high level of knowledge about strategies to combat climate change. The students were most aware that planting trees and protecting forests reduce carbon dioxide in the atmosphere (WM = 4.80, SD = 0.43). They also showed strong understanding that choosing environmentally friendly products reduces environmental impact (WM = 4.57, SD = 0.56), that sustainable practices such as recycling and conserving water reduce the effects of climate change (WM = 4.48, SD = 0.52), and that reducing energy consumption helps mitigate climate change (WM = 4.41, SD = 0.57). Awareness that renewable energy sources such as solar and wind reduce greenhouse gas emissions was also well understood (WM = 4.37, SD = 0.59). All indicators were interpreted as Strongly Agree. This pattern mirrors Magulod (2018) and Dela Cruz and Santos (2021), who reported that Filipino secondary learners rate tree planting, waste management, and resource conservation as the most familiar solutions because these are emphasized in school programs, YES-O activities, and community campaigns. Technical concepts such as renewable energy are recognized but slightly less prominent in basic education lessons. Lasco et al. (2019) explained that knowledge is strongest for visible, hands-on, and frequently practiced actions, which accounts for the highest scores for reforestation and waste reduction. The respondents are thus well informed about solutions to environmental problems. However, this high level of understanding contrasts with their behavior scores, suggesting that other factors may prevent consistent application in daily life. This knowledge-practice gap is well documented in

Philippine environmental education research. Pacificar (2024) and Joyosa et al. (2024) observed that students often possess high awareness and positive attitudes but only moderate or inconsistent practice. Valdez and Mercado (2024) and Nozaleda (2022) attributed the discrepancy to practical barriers such as lack of facilities, limited resources, inconvenience, or absence of community support. Ordonio (2024) similarly confirmed that even well-informed students struggle to act consistently when habits and social norms work against them.

On personal climate change, the overall weighted mean was 4.60 (SD = 0.44), interpreted as Strongly Agree, which indicates a deep personal connection to the issue. The students were most aware that their daily actions, such as transportation and consumption, contribute to climate change (WM = 4.75, SD = 0.52). They also strongly believed that climate change is a serious issue requiring immediate attention (WM = 4.70, SD = 0.51), felt responsible for helping reduce its effects in their own way (WM = 4.54, SD = 0.64), and were aware of how climate change affects their community and surroundings (WM = 4.51, SD = 0.58). They understood that the Philippines is highly vulnerable to effects such as stronger typhoons and rising sea levels (WM = 4.50, SD = 0.68). All indicators were interpreted as Strongly Agree. These findings are consistent with Magulod (2018), who found that Filipino secondary students recognize their personal role in climate change, perceive the country as highly vulnerable, and feel a personal obligation to act. Lasco et al. (2019) likewise noted that frequent exposure to hazards leads learners to see climate change as both national and personal. Such personal awareness suggests that the students possess the mindset and motivation that should serve as a foundation for translating knowledge into action. As emphasized by Valdez and Mercado (2024), when learners see climate change as relevant to their lives and feel personally responsible, they develop the motivation and values that are prerequisites for positive environmental behavior.

Level of awareness of basic climate concepts

With respect to attitude, the overall weighted mean was 4.03, interpreted as Agree, which indicates that the students generally hold positive values and a favorable disposition toward caring for the environment. The statement "It is important for me to protect the environment" obtained the highest mean of 4.51 (SD = 0.89), interpreted as Strongly Agree. Willingness to make sacrifices to protect the environment followed (WM = 4.21, SD = 0.71, Strongly Agree), and feeling guilty when doing things that harm the environment obtained a mean of 4.10 (SD = 0.75, Agree). The two items on community support for efforts to address climate change obtained lower means of 3.61 (SD = 0.85) and 3.70 (SD = 0.81), both interpreted as Agree, which indicates that the students perceive the support of their surroundings as only moderate even though they personally care. This hierarchy mirrors Saro et al. (2025), who reported that Filipino secondary students score highest on personal values, responsibility, and emotional connection to nature, with means often above 4.40, while ratings for community or public support are lower, averaging around 3.50 to 3.75. Pacificar (2024) noted that learners hold strong personal convictions and feel personal guilt or obligation, yet perceive peers, families, or community members as less committed. Bautista et al. (2025) confirmed that Filipino youth regard environmental protection as a personal duty but rate community involvement as only moderate, attributing this to what they observe in daily practices and local activities. These findings imply that the students have the values and emotional drive to protect the environment. Attitude is significant in this study because, according to the correlation results, it has the strongest relationship with awareness, which suggests that improving attitude could encourage more consistent action. Magulod (2018) and Ordonio (2024) established that attitude shows the strongest and most consistent correlation with environmental awareness, since positive and deeply held values shape how much attention

and knowledge students acquire. Saro et al. (2025) emphasized that attitude is the primary driver bridging understanding and action. Valdez and Mercado (2024) added that, even when barriers exist, students with more positive attitudes are far more likely to persist in practicing what they know.

For beliefs, the overall weighted mean was 2.25 (SD = 0.49), interpreted as Disagree, which indicates that the students generally hold positive convictions about the reality and solvability of climate change. The item "I believe that people can do something to stop climate change" is marked (R) in the instrument and obtained a mean of 1.62 (SD = 0.72), interpreted as Strongly Disagree. The respondents also strongly rejected the statement "I don't believe climate change is really happening" (WM = 1.64, SD = 0.80, Strongly Disagree) and disagreed that their actions would not make a difference (WM = 2.25, SD = 0.93, Disagree). However, they agreed with the statement that most people do not really care about climate change, which obtained the highest mean of 3.49 (SD = 1.11, Agree). This pattern of strong acceptance of climate change as real and solvable, together with agreement that others are indifferent, was documented by Ordonio (2024), who found that Filipino learners reject denial and helplessness statements but perceive public apathy as prevailing. Espinola and Roleda (2025) reported a similar contrast between personal conviction and perceived collective attitude. Magulod (2018) explained that this view develops from observing daily practices and conversations in which well-known problems are ignored by many people. While the students personally believe that climate change is happening and that solutions exist, they feel that those around them are indifferent, and this perception may contribute to the behavioral disconnection described later. Pacificar (2024) and Joyosa et al. (2024) confirmed that perceived low collective support or concern is a major barrier, because students who think others are not doing their part feel their own efforts will be unappreciated, which weakens motivation. Valdez and Mercado (2024) added that social norms and perceived peer and community engagement are powerful influences, and that consistent action requires believing that others are involved and that collective effort matters.

On level of concern, the overall weighted mean was 4.11 (SD = 0.63), interpreted as Agree, which indicates that the students generally feel worried about the environmental situation. The highest level of worry concerned the present effects of climate change (WM = 4.27, SD = 0.74, Strongly Agree). Understanding how the sun's energy interacts with the atmosphere made the students more concerned (WM = 4.08, SD = 0.65, Agree). Concern was lowest for the item "I think climate change will affect my future" (WM = 3.97, SD = 0.93, Agree), which shows that concern slightly decreases when looking ahead. This pattern mirrors Embate (2025), who observed that Filipino high school students show the strongest worry about currently experienced impacts such as extreme heat or typhoons, while concern about long-term personal effects, though still positive, is lower because future risks feel more distant. Magulod (2018) likewise reported that learners' emotional response is strongest toward problems they encounter firsthand. Concern serves as an emotional driving force, yet worry alone appears insufficient to bridge the gap between knowing what to do and doing it. Pacificar (2024) and Joyosa et al. (2024) confirmed that moderate to high concern does not automatically lead to consistent action.

Pro-environmental behaviors and barriers

The overall level of pro-environmental behaviors had a weighted mean of 3.47 (SD = 0.72), interpreted as Often. Among the ten indicators, saving electricity obtained the highest

weighted mean (WM = 4.03, SD = 1.13, Often), followed by saving water (WM = 4.00, SD = 1.12, Often) and properly disposing of trash (WM = 3.89, SD = 1.03, Often). Participating in environmental activities with friends obtained a mean of 3.46 (SD = 1.04, Often). The remaining practices were interpreted as Sometimes: walking or biking instead of taking a car (WM = 3.36, SD = 1.08), recycling paper, plastic, and glass (WM = 3.34, SD = 0.92), using energy-efficient light bulbs (WM = 3.29, SD = 1.16), choosing to eat less meat (WM = 3.17, SD = 1.07), bringing a reusable bag (WM = 3.11, SD = 1.09), and talking with family and friends about climate change (WM = 3.05, SD = 1.11). The relatively high standard deviations in most items indicate notable differences in how frequently individual respondents perform these actions. This pattern mirrors Pacificar (2024) and Bautista et al. (2025), who reported the highest frequency for simple, low-effort habits such as energy and water conservation and waste management, with wide variation among students. Magulod (2018) and Ordonio (2024) confirmed that actions taught repeatedly in school, free, and easy to do are the most consistent, while those requiring extra effort, cost, or habit change are practiced less often. Respondents therefore frequently practice basic and widely promoted habits, but behaviors requiring lifestyle adjustments, additional effort, or changes in social habits are only occasionally practiced.

This pattern aligns with the barriers identified, which were measured through frequencies and percentages. The most prominent barrier was lack of time, cited by 87 respondents (71.31%), followed by the perception that actions are too difficult or inconvenient (f = 69, 56.56%). Other significant obstacles were uncertainty about which actions are most effective (f = 51, 41.80%), feeling overwhelmed by the problem of climate change (f = 50, 40.98%), and the belief that friends do not care about the environment (f = 49, 40.16%). Lower-ranked barriers included doubt that personal actions make a difference (f = 38, 31.15%), the high price of environmentally friendly products (f = 34, 27.87%), not knowing what to do (f = 24, 19.67%), the belief that family does not care about the environment (f = 24, 19.67%), and the cost of being environmentally friendly (f = 23, 18.85%). The least reported were not fully understanding how climate change works (f = 17, 13.93%) and doubt about one's own ability to do it (f = 1, 0.82%). Time constraints and inconvenience emerged as the top barriers, followed by uncertainty, social indifference, and cost, while lack of knowledge was among the least cited. This matches Pacificar (2024) and Bautista et al. (2025), who documented that Filipino students rate practical and situational factors as far more limiting than lack of information. Dela Cruz and Santos (2021) and Valdez and Mercado (2024) documented the same barriers of inconvenience, lack of time, and uncertainty as top reasons why knowledge and positive attitudes do not translate into action. The high prevalence of time constraints and inconvenience explains why low-effort behaviors such as saving water and electricity are frequent while actions requiring planning or lifestyle change are less common. The agreement that most people do not care about climate change (WM = 3.49) further suggests that low social support and prevailing norms may discourage deeper or more visible action, consistent with Espinola and Roleda (2025) and Joyosa et al. (2024). Because lack of knowledge was among the least cited barriers, the gap between awareness and action is driven more by feasibility, convenience, and social support than by a lack of information. Valdez and Mercado (2024) and Saro et al. (2025) emphasized that when students already know what to do, action depends on how easy, accessible, and socially supported the behavior is. Joyosa et al. (2024) added that interventions should reduce effort, make habits routine, and build collective support rather than simply add information.

Relationship between awareness and pro-environmental behaviors

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The Pearson Product-Moment Correlation Coefficient (Pearson r) was used to test the relationships between awareness variables and pro-environmental behaviors, with significance set at $p < .05$ and 120 degrees of freedom. Concern (mean = 4.11) showed a moderate positive and significant relationship ($r = 0.332$, $p < .001$), and the null hypothesis was rejected. Attitude (mean = 4.03) showed a moderate positive and significant relationship ($r = 0.457$, $p < .001$), and the null hypothesis was rejected. Awareness and pro-environmental practices also showed a moderate positive significant relationship ($r = 0.316$, $p < 0.001$), confirming that higher awareness corresponds to more frequent environmental action. In contrast, belief (mean = 2.25) showed a negligible negative and non-significant relationship ($r = -0.099$, $p = 0.280$), and the null hypothesis was not rejected. The results align closely with Magulod (2018), who reported that awareness correlated moderately with concern ($r = 0.31$ to 0.35), strongly with attitude ($r = 0.44$ to 0.48), and moderately with practices ($r = 0.29$ to 0.34), with no meaningful link to beliefs because students already accepted climate change as real regardless of knowledge level. Pacificar (2024) and Bautista et al. (2025) recorded identical patterns, and Embate (2025) confirmed that higher awareness raises worry, positive valuation, and action tendency but never alters pre-established acceptance of climate reality. Lasco et al. (2019) and Embate (2025) found moderate correlations ($r = 0.28$ to 0.35) and emphasized that awareness and attitude are prerequisites but not sufficient. As awareness increases, concern, positive attitude, and engagement in environmental practices also tend to increase. The significant link with concern indicates that greater knowledge of causes, effects, and risks leads to higher worry and recognition of the issue's seriousness. The stronger correlation with attitude shows that knowledge shapes positive valuation of environmental protection, willingness to act, and sense of responsibility, a pattern Lasco et al. (2019) and Valdez and Mercado (2024) described as attitude being the strongest correlate of awareness. The significant relationship with practices confirms that awareness is a key driver of behavior, yet its moderate strength also confirms an attitude-behavior gap, as knowledge alone cannot fully translate into action because of the practical and social barriers identified earlier. Joyosa et al. (2024) and Espinola and Roleda (2025) explained that r values between 0.30 and 0.36 are typical in Philippine studies, showing that awareness is necessary but not sufficient. The non-significant result for beliefs is expected because the overall belief score was already low (Disagree level), meaning respondents already accept the reality and human cause of climate change. Magulod (2018) and Pacificar (2024) similarly found belief scores already at Strongly Disagree toward denial statements, leaving no variation to correlate with awareness. Ordonio (2024) and Saro et al. (2025) emphasized that knowledge strengthens emotion, values, and habits but does not shift belief, since belief was already positive from the start.

Synthesis of findings

Taken together, the results show that the 122 Grade 7 respondents possess a high level of understanding of basic climate concepts, with overall weighted means of 4.51 for causes, 4.60 for effects, 4.52 for mitigation and sustainability practices, and 4.60 for personal climate change, all interpreted as Strongly Agree. Their awareness was positive in attitude (WM = 4.03) and concern (WM = 4.11), and their beliefs rejected denial and helplessness (WM = 2.25), although they perceived that most people do not care (WM = 3.49). Pro-environmental behaviors were practiced Often overall (WM = 3.47, SD = 0.72), but only simple and convenient habits were consistently performed. The leading barriers were lack of time (71.31%) and inconvenience (56.56%), while lack of understanding was reported by only

13.93%. The Pearson r results showed significant moderate positive relationships of awareness with concern ($r = 0.332$), attitude ($r = 0.457$), and pro-environmental practices ($r = 0.316$), all at $p < .001$, and a non-significant relationship with beliefs ($r = -0.099$, $p = 0.280$). These findings address the objectives of the study by showing that the main gap lies not in knowledge but in the conversion of knowledge into consistent action, which is constrained by practical and social barriers. They contribute to the literature by confirming, within a Grade 7 public school context, patterns reported in Philippine studies, and they offer an empirical basis for the research-based environmental education learning exemplar that is presented in the next chapter. That learning exemplar should emphasize convenient, routine, and socially supported actions in addition to content knowledge.

CONCLUSION

This study assessed the factors influencing climate change awareness among Grade 7 students at Cangawa National High School, Cangawa, Buenavista, Bohol, for the school year 2025-2026, with the aim of providing a basis for a research-based environmental education learning exemplar. Employing a descriptive-correlational design and an adapted questionnaire, the study examined the respondents' level of understanding of basic climate concepts, their awareness as reflected in attitudes, beliefs, and levels of concern, their pro-environmental behaviors in daily life, and the barriers they encountered in practicing such behaviors. Data were analyzed using simple percentages, standard deviations, and the Pearson product-moment correlation coefficient. Taken together, the findings present a coherent picture of students who are knowledgeable and generally concerned about climate change, yet who do not always translate that knowledge into consistent action.

The respondents demonstrated a very high level of understanding of basic climate concepts across all areas examined. They strongly recognized the major causes of climate change, including deforestation, improper waste disposal and garbage burning, human activities, greenhouse gas emissions, and fossil fuel use. Their understanding of the effects of climate change was equally high, particularly with regard to food production and water availability, ecosystems, extreme weather events, and human health. Sea-level rise caused by melting glaciers and ice sheets received a relatively lower rating, although it remained at an agreeable level. The respondents also strongly acknowledged the value of mitigation and sustainability practices, such as tree planting and forest protection, the use of environmentally friendly products, recycling, water conservation, energy conservation, and renewable energy. Furthermore, they showed a very high level of understanding of personal climate change, recognizing the contribution of daily activities to the problem, the vulnerability of the Philippines, the seriousness of climate change, their own personal responsibility, and its effects on their communities and surroundings. It can therefore be concluded that the students possess a strong conceptual foundation in climate science and its local relevance.

Beyond this understanding, the respondents' awareness was reflected in generally positive attitudes, sound beliefs, and meaningful concern. They recognized the importance of protecting the environment, felt responsible for environmentally harmful actions, and expressed willingness to make sacrifices for environmental protection. With respect to beliefs, they generally disagreed with negative or dismissive views about climate change, although they agreed that many people do not really care about it. In terms of concern, they were generally worried about climate change, particularly its effects and its potential impact on their future, and they agreed that understanding climate-related processes heightened their concern. These results suggest that the students hold favorable dispositions toward environmental protection, and that deeper knowledge tends to strengthen their emotional and personal investment in the issue.

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Despite this favorable understanding and awareness, the translation of knowledge into practice was only partial. The respondents often practiced pro-environmental behaviors in their daily lives, such as saving electricity and water, disposing of waste properly, and participating in environmental activities with friends. However, several behaviors were practiced only sometimes, including recycling paper, plastic, and glass, walking or biking instead of using a car, discussing climate change with family and friends, using reusable bags, eating less meat, and using energy-efficient light bulbs. This gap between knowing and doing is partly explained by the barriers the respondents reported. Lack of time was the most commonly encountered barrier, followed by the perception that environmentally friendly actions are difficult or inconvenient. Other frequently reported barriers included uncertainty about which actions are most effective, feeling overwhelmed by climate change, and the perception that friends did not care about the environment. Some respondents also expressed doubts about the impact of their actions and concerns about the cost of environmentally friendly products, while fewer identified lack of knowledge, limited family support, financial concerns, and insufficient understanding of climate change as barriers. The least reported barrier was uncertainty about being able to carry out the actions personally. These results indicate that the obstacles faced by the students are largely practical, social, and motivational rather than rooted in a lack of knowledge.

The correlational analysis further clarified how awareness relates to behavior. Concern and attitude toward climate change had significant moderate positive relationships with the respondents' pro-environmental behaviors, indicating that students who are more concerned and who hold more favorable attitudes are more likely to act in environmentally responsible ways. In contrast, beliefs about climate change had a negligible negative relationship with pro-environmental behaviors, which was not statistically significant. Accordingly, the null hypothesis was rejected for concern and attitude, as both demonstrated significant relationships with pro-environmental behaviors, but it was accepted for beliefs, as no significant relationship was found. This suggests that affective and attitudinal dimensions, rather than beliefs alone, are the more meaningful correlates of students' environmental action.

In light of these conclusions, several recommendations follow. Students are encouraged to strengthen their understanding of the causes, effects, mitigation and sustainability practices, and personal implications of climate change, and to translate their knowledge and awareness into consistent daily practice. Science teachers are encouraged to use contextualized and learner-centered strategies, integrating practical activities, discussions, environmental projects, and real-life examples that enable students to apply climate concepts through responsible practices. Master teachers may support this effort by providing technical assistance and mentoring, facilitating the sharing of effective teaching strategies, and supporting the integration of the proposed learning exemplar into classroom activities. School heads are likewise encouraged to support school-based environmental education programs by providing resources, facilities, and opportunities for participation, and by encouraging activities that address the identified barriers. Parents and community members may reinforce environmental awareness at home and in the community through waste management, conservation, clean-up activities, and similar initiatives, while the Department of Education may consider these findings in strengthening climate change and environmental education through improved learning resources, teacher development activities, and school-based programs.

Finally, the researcher is encouraged to refine and implement the proposed research-based environmental education learning exemplar, evaluate its effectiveness after implementation, and revise it based on learners' responses and outcomes. Future researchers

may conduct related studies involving other grade levels, schools, or communities to further examine climate change understanding, awareness, pro-environmental behaviors, and barriers, and may consider experimental or intervention-based research to determine the effectiveness of environmental education learning materials. The proposed learning exemplar itself should be adapted to the identified gaps in students' understanding and awareness, their pro-environmental behaviors, and the barriers they encounter, and should contain age-appropriate, contextualized, and engaging activities that strengthen basic climate concepts and encourage students to apply their knowledge through responsible environmental practices. Overall, the study affirms that while Grade 7 students at Cangawa National High School have a strong grasp of climate concepts, sustained educational and community support is needed to convert their concern and positive attitudes into lasting pro-environmental behavior.

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